Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Ankle and foot disorders.

Bibliographic Source(s)

Ankle and foot disorders. In: Hegmann KT, editor(s). Occupational medicine practice guidelines. Evaluation and management of common health problems and functional recovery in workers. 3rd ed. Elk Grove Village (IL): American College of Occupational and Environmental Medicine (ACOEM); 2011. p. 1-268. [835 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Ankle and foot complaints. Elk Grove Village (IL): American College of Occupational and Environmental Medicine (ACOEM); 2004. 27 p. [47 references]

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 22, 2016 – Opioid pain medicines : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

Definitions for the strength of evidence ratings (A, B, C, and I) and the criteria for evidence-based recommendations are presented at the end of the "Major Recommendations" field.

Summary Tables: Recommendations and Evidence

Table 1 summarizes the recommendations from the Evidence-based Practice Ankle and Foot Panel for diagnostic testing for ankle and foot disorders. Table 2 is a summary of recommendations for managing these disorders. Recommendations are based on critically appraised higher quality research evidence and on expert consensus, observing First Principles when higher quality evidence was unavailable or inconsistent. The reader is cautioned to utilize the more detailed indications, specific appropriate diagnoses, temporal sequencing, prior testing or treatment, and contraindications that are elaborated in more detail for each test or treatment in the body of this Guideline in using these recommendations in clinical practice or medical management. These recommendations are not simple "yes/no" criteria, and the evidence supporting them is in nearly all circumstances developed from typical patients, not unusual situations or exceptions.

Recommendations are made under the following categories:

- Strongly Recommended, "A" Level
- Moderately Recommended, "B" Level
- Recommended, "C" Level
- Insufficient-Recommended (Consensus-based), "I" Level
- Insufficient-No Recommendation (Consensus-based), "I" Level
- Insufficient-Not Recommended (Consensus-based), "I" Level
- Not Recommended, "C" Level
- Moderately Not Recommended, "B" Level
- Strongly Not Recommended, "A" Level

Table 1. Summary of Recommendations for Diagnostic and Other Testing for Ankle and Foot Disorders

Test	Recommendation
X-ray	X-ray for diagnosing insertional Achilles tendon disorders or retrocalcaneal bursitis or evaluating blunt trauma or suspected fracture – Recommended, Insufficient Evidence (I) Routine use of x-ray to diagnose acute Achilles tendon rupture – No Recommendation, Insufficient Evidence (I) Routine use of x-ray for plantar fasciitis or plantar heel pain – Not Recommended, Insufficient Evidence (I) Use of x-ray for plantar fasciitis or plantar heel pain when fractures are suspected including calcaneal stress fracture, osseous tumors, or non-routine confirmation of diagnosis – Recommended, Insufficient Evidence (I) Routine use of x-ray for evaluation of acute ankle sprain when fracture is not suspected – No Recommendation, Insufficient Evidence (I) X-rays in the case of ankle sprain if fracture likely and the differential diagnosis reflects suspicion of fracture – Recommended, Insufficient Evidence (I) Routine use of talar-tilt and anterior drawer stress x-ray for evaluation of acute ankle ligament rupture – Not Recommended, Insufficient Evidence (I) Use of talar-tilt and anterior drawer stress x-ray for evaluation of subacute or chronic ankle pain – No Recommendation, Insufficient Evidence (I) X-ray for suspected acute ankle fractures as a first-line study – Recommended, Insufficient Evidence (I) X-ray as a first-line study for suspected hindfoot fractures (calcaneus) – Moderately Recommended, Evidence (B) X-ray as a first-line study for suspected hindfoot fractures (talus) – Recommended, Insufficient Evidence (I) X-ray as a first-line study for suspected forefoot fractures – Recommended, Insufficient Evidence (I)
Arthrography	Routine use of arthrography for evaluation of acute ankle sprain – Not Recommended, Insufficient Evidence (I) Routine use of arthrography for evaluation of subacute or chronic ankle sprain – No Recommendation, Insufficient Evidence (I)

Test	Recommendation
MRI	Magnetic resonance imaging (MRI) for evaluating Achilles tendinopathy including paratendonitis, tendinosis, and retrocalcaneal bursitis – Recommended, Insufficient Evidence (I) MRI for evaluation of acute Achilles tendon rupture – Recommended, Insufficient Evidence (I) MRI for evaluation of select patients with plantar fasciitis – Recommended, Insufficient Evidence (I) MRI for diagnosis of select cases of clinically suspected tarsal tunnel syndrome (TTS) who have failed conservative management or if a mass lesion is suspected – Recommended, Insufficient Evidence (I) Routine use of MRI for the initial evaluation of TTS – Not Recommended, Insufficient Evidence (I) MRI for assessment of select patients with subacute or chronic ankle sprain – Recommended, Insufficient Evidence (I) MRI for assessment of acute ankle sprain – No Recommendation, Insufficient Evidence (I) MRI for investigation of distal lower extremity and ankle fractures – Recommended, Insufficient Evidence (I) MRI for suspected acute occult fracture of the talus and calcaneus – Recommended, Insufficient Evidence (I) MRI for calcaneus fractures for identification of complications in non-acute fracture patients – Recommended, Evidence (C) MRI for suspected occult and stress fracture in select patients – Recommended, Insufficient Evidence (I)
Magnetic Resonance Arthrography (MRA)	MRA for assessment of subacute or chronic ankle sprain – No Recommendation, Insufficient Evidence (I) MRA for assessment of acute ankle sprain – Not Recommended, Insufficient Evidence (I)
Computed Tomography (CT)	CT for diagnosing Achilles tendinopathy – Not Recommended, Insufficient Evidence (I) CT for assessment of select patients with subacute or chronic ankle sprain – Recommended, Insufficient Evidence (I) CT for assessment of patients with acute ankle sprain – No Recommendation, Insufficient Evidence (I) CT for investigation of distal lower extremity and ankle fractures – Recommended, Insufficient Evidence (I) CT for investigation of forefoot and midfoot fractures – Recommended, Insufficient Evidence (I)
Single-photon Emission Computed Tomography (SPECT-CT)	SPECT-CT for diagnosis of plantar heel pain – Not Recommended, Insufficient Evidence (I)
Ultrasound	Ultrasound for diagnosing Achilles tendinopathy and may be particularly useful for differentiation of paratendonitis and tendinosis and for identifying fluid in the retrocalcaneal bursa. – Recommended, Insufficient Evidence (I) Ultrasound to diagnose acute Achilles tendon rupture – Recommended, Insufficient Evidence (I) Ultrasound for evaluation of select patients with plantar fasciitis – Recommended, Insufficient Evidence (I) Ultrasound to identify suspected space occupying lesions in the tarsal tunnel after failed conservative management or as an adjunct to guide interventional therapies – Recommended, Insufficient Evidence (I) Ultrasound as a routine diagnostic test for TTS – Not Recommended, Insufficient Evidence (I) Ultrasound for evaluation of select patients with acute ankle sprain – Not Recommended, Insufficient Evidence (I) Ultrasound for evaluation of patients with subacute or chronic ankle sprain – No Recommendation, Insufficient Evidence (I)

Test	Recommendation
	Ultrasound for evaluation of soft-tissue injury associated with select displaced fractures or suspected malleolar stress fractures – Recommended, Insufficient Evidence (I)
Electrodiagnostic Studies	Nerve conduction studies (NCS) for confirming diagnosis of entrapment of the tibial nerve at the ankle for cases that do not improve with conservative treatment or if considering surgical release after excluding the possibility of other causes such as polyneuropathy and radiculopathy – Recommended, Insufficient Evidence (I) NCS for initial evaluation and most TTS patients as NCS do not change the management of the condition during the first 4 to 6 weeks while conservative therapy is being tried – Not Recommended, Insufficient Evidence (I) Electromyogram (EMG) for initial evaluation, diagnosis or pre-operative assessment of TTS patients. Electromyography (as distinguished from a nerve conduction study) is not generally recommended as there is no quality evidence demonstrating the utility of EMG in the diagnosis of TTS. – No Recommendation, Insufficient Evidence (I)
Bone Scans	Bone scans for select patients with acute ankle sprain – Recommended, Insufficient Evidence (I) Bone scans for patients with subacute or chronic ankle sprain – No Recommendation, Insufficient Evidence (I) Bone scans for diagnosis of occult and stress fractures in select patients – Recommended, Insufficient Evidence (I) CT for investigation of hindfoot fractures – Recommended, Evidence (C) Bone scans for diagnosis of occult and stress fractures in select patients – Recommended, Insufficient Evidence (I)

Table 2. Summary of Recommendations for Managing Ankle and Foot Disorders

Ankle and Foot Disorder	Treatment with Evidence Rating/Recommendation Level		
	Recommended	No Recommendation	Not Recommended
Achilles Tendinopathy	Acetaminophen (I) Non-steroidal anti-inflammatory drugs (NSAIDs) for acute Achilles tendinopathy pain (C) NSAIDs for subacute or chronic Achilles tendinopathy pain or postoperative pain or inflammation (I) Topical NSAIDs for acute or subacute Achilles tendinosis (C) Topical NSAIDs for chronic Achilles tendinosis (I) Topical glyceryl trinitrate for pain in select patients with chronic Achilles tendinopathy after other conservative treatment alternatives have failed (C) Opioids for short-term use to treat pain after Achilles tendon surgery or for patients who have encountered surgical complications (I) Low-dose glucocorticosteroid injections as an alternative therapy for chronic Achilles tendinopathy and associated paratendon bursitis (I) Glycosaminoglycan polysulfate local injection as an alternative therapy for chronic Achilles tendinopathy (C)	Vitamins as therapeutic intervention or for prevention of Achilles tendinopathy in doses recommended by U.S. Food and Drug Administration (FDA) (I) Lidocaine patches (I) Topical glyceryl trinitrate for acute, subacute, or post-operative Achilles tendinopathy (I) Glycosaminoglycan polysulfate local injection for acute, subacute, or postoperative Achilles tendinopathy (I) Actovegin injection for	Oral or intramuscular (IM) steroid preparations for acute, subacute, chronic, or postoperative Achilles tendinopathy (I) Opioids for acute, subacute, or chronic Achilles tendinopathy pain (I) High doses (exceeding U.S. FDA recommendations) or expensive compounded preparation vitamins for prevention of Achilles tendinopathy (I) Low-dose glucocorticosteroid injections for acute, subacute, or post-operative Achilles tendinopathy (I) Heparin subcutaneous injection for acute or

Ankle and Foot Disorder	Polidocanol injection for chronic Achilles tendinopathy (C) Treatment with Evidence Rating/Recommendation Level Education (I) Eccentric exercises for chronic Achilles tendinopathy (B) Recommended Stretching and loading exercises, particularly eccentric exercises, for acute, subacute, or post-operative Achilles tendinopathy (I) Cryotherapy (I) Heat (I) Extracorporeal shockwave therapy as an adjunct to an eccentric exercise for chronic, recalcitrant Achilles tendinopathy (C) Iontophoresis with glucocorticosteroid for acute, subacute, or chronic Achilles tendinopathy (I) Low-level laser therapy for select patients with chronic Achilles tendinopathy (C) Night splints and walking boots for post-operative Achilles tendinopathy (I) Surgery for select cases of chronic Achilles tendinopathy without rupture. There is no recommendation for any particular procedure over another. (I)	acute, subacute, or chronic Achilles tendinopathy (I) No Recommendation Prolotherapy injections for chronic Achilles tendinopathy (I) Polidocanol injection for acute, subacute, or post-operative Achilles tendinopathy (I) High-volume image-guided injection for chronic Achilles tendinopathy (I) Night splint for acute, subacute or chronic Achilles tendinopathy (I) Orthotic devices such as heel lifts, heel pads, or heel braces (I) Acupuncture (I) Massage and tendon mobilization (I) Ultrasound (I) Iontophoresis with NSAIDs (I) Phonophoresis (I) Low-level laser therapy for acute, subacute, or post-operative Achilles tendinopathy (I) Topical NSAIDs for post-operative Achilles tendinosis (I) Iontophoresis with glucocorticosteroid for post-operative Achilles tendinopathy (I)	subacute Achilles tendinopathy (C) Heparin subcutaneous injection for chronic Achilles tendinopathy (I) Aprotinin injection for acute or subacute Achilles tendinopathy (I) Aprotinin injection for chronic Achilles tendinopathy (C) Platelet-rich plasma injections (B) Magnets (I) Extracorporeal shockwave therapy for acute, subacute, or post-operative Achilles tendinopathy (I) Dry needling (I) Surgery for acute or subacute Achilles tendinopathy without rupture (I)
Achilles Tendon Rupture	Acetaminophen as analgesia for pain as a result of acute Achilles tendon rupture (I) NSAIDs for pain treatment of acute and subacute Achilles tendon rupture (I)	Early weight bearing for non-operatively managed Achilles tendon ruptures (I) Augmented repair for	Opioids for treatment of pain from subacute or chronic Achilles tendon repair (I) Augmented repair for acute ruptures, unless primary

Treatment with Evidence Rating/Recommendation Level			
Ankle and Foot Disorder	Limited use of opioids for treatment of acute Achilles tendon rupture as a treatment option for select patients with acute or moderate to severe pain related to Achilles rupture. Limited use of opioids for a few days for select patients who have undergone recent Achilles tendon repair or encountered surgical complications. (I) Self-application of cryotherapy for acute or post-operative Achilles tendon rupture (I) Self-application of heat for acute, subacute, chronic, or post-operative Achilles tendon rupture (I) Surgical repair for ruptured Achilles tendon (C) Non-operative management with functional splinting and casting for Achilles tendon rupture (C) Open repair and percutaneous approaches for patients undergoing operative repair. There is no recommendation of one approach over the other. (C) A primarily home-based rehabilitation program (exercise and education) for Achilles tendon rupture (I) Early weight bearing for post-operative rehabilitation of Achilles tendon ruptures for functional bracing or rigid immobilization (A) Functional splinting (bracing) as primary treatment method for postoperative care of Achilles tendon ruptures (B) Prophylaxis for prevention of deep venous thrombosis (C)	chronic or neglected ruptures (I) Prophylaxis, including warfarin, heparin, low molecular weight heparin, graded compression stockings, aspirin, or Factor Xa to prevent deep venous thrombosis (I) Transcutaneous electrical nerve stimulation (TENS) as post-operative treatment for Achilles tendon rupture (I)	repair is not possible (C)
Plantar Heel ("Plantar Fasciitis")	Education for select patients (I) Acetaminophen (I) NSAIDs (I) Limited use of opioids for a few postoperative days for select patients (I) Topical NSAIDs for acute, subacute, or chronic plantar fascial pain syndromes (I) Botulinum toxin A injection for select chronic plantar fasciitis (C) Glucocorticosteroid injections for short-term relief of chronic plantar fasciitis (C) Cryotherapy (I) Heat (I) Prefabricated night splints for subacute or chronic plantar heel pain (I) Orthotic devices (C) Stretching exercises of plantar fascia and Achilles tendon (I) Heel taping as a short-term treatment for acute or subacute	Short-term use of vitamins for treatment or prevention (I) Lidocaine patches (I) Topical NSAIDs for post-operative plantar fasciitis (I) Hyperosmolar dextrose injections (I) Platelet rich plasma injections (I) Casting for chronic plantar fasciitis (I) Custom orthoses (I) Orthotic devices for prevention of plantar fasciitis or lower extremity disorders (I) Special fitted or shock	Infliximab (I) Opioids for acute, subacute or chronic plantar fasciitis (I) Oral or intramuscular glucocorticosteroid (I) Wheat grass cream (B) Autologous blood injection (C) Botulinum toxin A injection for acute or subacute plantar fasciitis (I) Glucocorticosteroid injections for acute or subacute plantar fasciitis (I) Ultrasound or scintigraphy imaging techniques to guide injection (C) Magnets (A) ESWT for acute or subacute

Ankle and Foot Disorder	plantar fasciitis or heel pain (C) Treatment with Evidence Rating/Recommendation Level Extracorporeal shockwave therapy (ESWT) for chronic plantar fasciitis in select patients with chronic recalcitrant conditions (I) Recommended Local anesthesia in conjunction with high-energy ESWT (I) Intracorporeal pneumatic shock therapy for select chronic plantar fasciitis (B) Surgical release for select chronic recalcitrant plantar fasciitis. There is no recommendation for any particular procedure or method over another. (I)	absorbing shoes for prevention of plantar fasciitis or lower extremity disorders (I) No Recommendation Heel taping for chronic plantar fasciitis or heel pain (I) Acupuncture (I) Low frequency electrical stimulation (I) Local anesthesia used in conjunction with low- or medium-energy ESWT (I) Radial ESWT for chronic plantar fasciitis (I) Iontophoresis with glucocorticosteroid or acetic acid for select patients (I) Low-level laser therapy (I) Manipulation (I) Massage and tendon mobilization (I) Phonophoresis (I) Radiation therapy for chronic plantar heel pain (I) Cryosurgery for chronic plantar heel pain (I) Percutaneous calcaneus fenestration for chronic plantar heel pain (I) Radiofrequency microtenotomy for chronic plantar fasciitis (I)	plantar fasciitis (I) Ultrasound or fluoroscopic guidance is not recommended over Not Recommended application of energy at point of maximal tenderness (I) Radial ESWT for acute or subacute plantar fasciitis (I) Ultrasound (C) Cryosurgery for acute or subacute plantar heel pain (I) Surgical release for acute or subacute plantar fasciitis (I)
Tarsal Tunnel Syndrome (TTS)	Self-application of ice/heat (I) Oral glucocorticosteroids for TTS patients who decline tarsal tunnel injection (I) Limited use (a few days) of opioids for select patients who have undergone recent tarsal tunnel release and have large incisions or	Rest (I) Taping (I) Acetaminophen or NSAIDs (I)	Diuretics (I) Routine use of opioids (I) Pyridoxine for routine treatment of TTS in patients without vitamin deficiencies

	Treatment with Evidence Rating/Recommendation Level		
Ankle and Foot Disorder	encountered significant complications that cannot be managed with other means (I) Lidocaine patches for select cases (I)	Other vitamins (I) Exercises (I)	(I) Insulin injections (I)
	Recommended Glucocorticosteroid injections (I)	Trial of nocturnal splinting (I)	Botulinum injections (I) Not Recommended
	Surgical release of posterior tibial nerve impingement at tarsal tunnel upon failure of conservative treatment and in presence of space occupying lesion. Surgical release for cases with non-specific causes are otherwise expected to have mixed results and patients should be counseled regarding potential lack of benefit before considering surgery. There is no recommendation for any specific technique as there is lack of quality evidence. (I) Return-to-work programs for patients with TTS particularly those with significant lost time (I)	No Recommendation Orthotics (I) Acupuncture (I) Ultrasound (I) Iontophoresis (I) Phonophoresis (I) Work restrictions (I)	Magnets (I) Manipulation or mobilization of the distal lower extremity (I)
Ankle Sprain	Education for select patients (I) Acetaminophen (B) NSAIDs for acute ankle sprain (A) NSAIDs for subacute, chronic, or postoperative ankle sprain (I) Limited use of opioids for no more than 1 week for select patients with severe pain related to acute ankle sprain (A) Limited use of opioids for no more than 1 week may be indicated for those that have undergone ankle ligament repair surgery or those who encountered surgical complications (I) Topical NSAIDs for acute ankle sprain (B) Early mobilization for acute ankle sprains without fracture (B) Semi-rigid pneumatic or gel ankle brace supports for acute ankle sprain, with optional use as needed for mild and moderate sprains (I) Rest or non-weight bearing as an initial intervention for acute ankle sprain for patients unable to tolerate weight (I) Cryotherapy for acute ankle sprain (I) Elevation for controlling edema of acute ankle sprains (I) Ankle support (brace, tape) for prevention (initial injury) of ankle injury (C) Ankle support (brace, tape) for prevention (recurrent injury) of ankle injury (I) Appropriate activity specific footwear for prevention of ankle sprain or recurrent ankle sprain. There is no recommendation for the use of one type of shoe over another for prevention of ankle sprain or lower extremity disorders. (I) Balance/proprioception training for prevention of initial and recurrent ankle injury (C)	Vitamins as therapeutic intervention or for prevention of ankle sprain in doses recommended by the U.S. FDA (I) Benzydamine (I) Medications (gels) that stimulate sensation of cold (I) Lidocaine patches (I) Topical comfrey extract (I) Movelat (I) Topical NSAIDs for subacute, chronic, or post-operative ankle sprain (I) Autologous blood injection (I) Glucocorticosteroid injection (I) Hyaluronic acid injection (I) Platelet rich plasma injection (I) Contrast baths for acute ankle sprain (I) Non-rigid support therapies (i.e., tape,	Oral proteolytic enzyme preparations (B) Oral streptokinase/streptodornase preparations (I) Oral or intramuscular steroid preparations (I) High doses (exceeding U.S. FDA recommendations) or expensive compounded preparation vitamins for prevention of ankle sprain (I) Immobilization by cast for patients with acute mild to moderate ankle sprain as splints should be sufficient. (I) Diathermy for acute ankle sprain (B) Diathermy for subacute or chronic ankle sprain (I) Low frequency electrical stimulation (C) High-voltage pulsed stimulation (I) Low-level laser therapy for acute ankle sprain (B) Low-level laser therapy for subacute or chronic ankle sprain (I) Ultrasound for acute ankle

	Treatment with Evidence Rating/Recommendation Level		
Ankle and Foot Disorder	Physical or occupational therapy for select patients with acute, subacute, or chronic ankle sprain (I) Physical or occupational therapy for chronic ankle instability (I)	elastic wrap, or tubular elastic) for acute ankle sprain (I)	sprain (B) Ultrasound for subacute or chronic ankle sprain (I)
	Recommended	No Recommendation	Not Recommended
	Ligament reconstruction for select cases of chronic ankle instability (I) Short-term cast immobilization with early mobilization and physical or occupational therapy for ankle instability (I)	Walking boot for acute ankle sprain (I) Heat for acute ankle sprain (I) Immobilization by cast for severe ankle sprain as splints should be sufficient (I) Compression therapy (i.e., tape, elastic wrap, tubular elastic, or pneumatic compression devices) for acute ankle sprain (I) Magnets (I) Iontophoresis (I) Phonophoresis (I) Acupuncture (I) Manipulation or mobilization for acute or subacute ankle sprain (I) Manipulation or mobilization for chronic recurrent ankle sprain (I) Foot orthotics for prevention of ankle injury (I) Stretching or strengthening exercises for prevention of initial or recurrent ankle injury (I)	Hyperbaric oxygen therapy for acute ankle sprain (C) Hyperbaric oxygen therapy for subacute or chronic ankle sprain (I) Surgical repair for routine lateral ligament tear associated with acute or subacute ankle sprain (I)
Ankle and Foot Fractures	Pre-operative antibiotic prophylaxis for closed or open ankle fracture surgery (I) NSAIDs and acetaminophen for analgesia of pain associated with fracture (I) Limited use of opioids for acute and post-operative pain management as adjunctive therapy to more effective treatments (I)	Non-operative management of tibial shaft fractures (I) Arthroscopy assisted open reduction and internal fixation (ORIF) for distal fibular fractures (I)	Use of nasal spray calcitonin for prophylaxis of post-fracture osteopenia (C) Performing repair of torn deltoid ligament in association with ORIF for ankle fracture (I) Surgical thigh tourniquet for

	Treatment with Evidence Rating/Recommendation Level		
Ankle and Foot Disorder	For open fractures, update tetanus immunization status as necessary (I) Adequate analgesia (conscious sedation, intraarticular block) for performing non-operative closed reduction of ankle fractures (C)	Use of a specific operative product (I) Type of post-operative care/dressing (I)	surgical treatment of closed displaced ankle fractures (C) Interferential therapy for postoperative swelling
	Recommended	No Recommendation	Not Recommended
	Adequate analgesia (hematoma block, general anesthesia) for performing non-operative closed reduction of ankle fractures (I) Non-operative management for nondisplaced and reduced stable ankle fractures (I) Closed reduction and immobilization for select non-comminuted closed displaced ankle fractures (I) Operative fixation for unstable closed displaced ankle fractures (C) Operative fixation for definitive management of displaced tibial shaft fracture (C) Operative fixation for distal extra-articular tibial fractures in select patients (I) Non-operative management in select circumstances for distal extra-articular tibial fractures (I) Non-operative management for tibial plafond fractures in select patients (I) Operative management for tibial plafond fractures in select patients (I) Operative fixation for unstable syndesmotic rupture (I) Non-operative management for stable syndesmotic injury (I) Operative fixation for displaced distal fibula fracture (I) Cast immobilization for management of ankle fractures (B) Early mobilization in the management of post-operative and stable non-operative ankle fractures (B) Early weight bearing of operatively fixated ankle fracture post-operatively (B) Pneumatic compression of foot and ankle to reduce swelling for patients with significant post-operative edema (C) Referral of patients with functional debilities or inability to return to work for physical or occupational therapy after cast removal (I)	Electrical stimulation for prevention of muscle atrophy in ankle and foot fracture management (I) Hyperbaric oxygen (I) Hypnosis (I)	following ORIF for displaced malleolar fracture (B) Manual therapy as part of an active post-ankle fracture rehabilitation program (C) Passive stretching for contractures after immobilization of ankle fractures (B) Ultrasound (B)
Hindfoot Fractures (Calcaneus, Talus)	Operative management for all displaced talar fractures – head, neck, body, lateral process (I) Non-operative management of osteochondral lesions of the talus for select patients (I) Operative intervention for osteochondral lesions of talus after initial course of conservative management. Chondroplasty,	Non-operative management of nondisplaced talar fractures – head, neck, body (I) Diathermy for	

Ankle and Foot Disorder	microfracture and osteochondral autograft recommended. (I) Treatment with Evidence Rating/Recommendation Level Non-operative cast immobilization for select calcaneus fractures (I)	management of edema associated with calcaneus fractures (I)	
	Recommended Operative management for select calcaneus fractures (I)	No Recommendation Calcium phosphate paste or bone graft for displaced intra-articular fracture defects (I)	Not Recommended
	Pneumatic compression of foot to reduce swelling for patients with significant edema after closed calcaneus fractures (C)		
Forefoot and Midfoot Fractures (Tarsal, Metatarsal, Phalangeal)	NSAIDs or acetaminophen to control pain from phalangeal or metatarsal fractures (I) Non-operative management of nondisplaced tarsal-metatarsal injury (Lisfranc) for select patients (I) Operative management for unstable tarsal-metatarsal injury – Lisfranc (I) Non-operative management for nondisplaced metatarsal fractures (I) Operative management for displaced metatarsal shaft fractures (I) Non-operative management of 5th metatarsal fractures (including Jones and Avulsion) for select patients (I) Operative management for 5th metatarsal fractures (Jones, Avulsion) for select patients (I) Immobilization for select patients with distal, middle, and proximal phalanx fractures (I) Operative management for select patients with distal, middle, and proximal phalanx fractures (I) Non-operative management for low risk lower extremity stress fracture (I)	Operative management of lower extremity stress fractures in select patients (I)	

Definitions:

Strength of Evidence Ratings

A = Strong evidence-base: Two or more high-quality studies*

B = Moderate evidence-base: At least one high-quality study or multiple lower-quality studies** relevant to the topic and the working population

C = Limited evidence-base: At least one study of intermediate-quality

I = Insufficient Evidence: Evidence is insufficient or irreconcilable

*For therapy and prevention, randomized controlled trials (RCTs) or crossover trials with narrow confidence intervals and minimal heterogeneity. For diagnosis and screening, cross sectional studies using independent gold standards. For prognosis, etiology or harms, prospective cohort studies with minimal heterogeneity.

**For therapy and prevention, well-conducted cohort studies. For prognosis, etiology or harms, well conducted retrospective cohort studies or untreated control arms of RCTs.

Strength of Recommendations

Recommendation	Evidence Rating	Description of Category
Strongly Recommended	A	The intervention is strongly recommended for appropriate patients. The intervention improves important health and functional outcomes based on high quality evidence, and the Evidence-Based Practice Panel (EBPP) concludes that benefits substantially outweigh harms and costs.
Moderately Recommended	B	The intervention is recommended for appropriate patients. The intervention improves important health and functional outcomes based on intermediate quality evidence that benefits substantially outweigh harms and costs.
Recommended	C	The intervention is recommended for appropriate patients. There is limited evidence that the intervention may improve important health and functional benefits.
Insufficient - Recommended (Consensus-based)	I	The intervention is recommended for appropriate patients and has nominal costs and essentially no potential for harm. The EBPP feels that the intervention constitutes best medical practice to acquire or provide information in order to best diagnose and treat a health condition and restore function in an expeditious manner. The EBPP believes based on the body of evidence, first principles, or collective experience that patients are best served by these practices, although the evidence is insufficient for an evidence-based recommendation.
Insufficient - No Recommendation (Consensus-based)	I	The evidence is insufficient to recommend for or against routinely providing the intervention. The EBPP makes no recommendation. Evidence that the intervention is effective is lacking, of poor quality, or conflicting and the balance of benefits, harms, and costs cannot be determined.
Insufficient - Not Recommended (Consensus-based)	I	The evidence is insufficient for an evidence-based recommendation. The intervention is not recommended for appropriate patients because of high costs or high potential for harm to the patient.
Not Recommended	C	Recommendation against routinely providing the intervention. The EBPP found at least intermediate evidence that harms and costs exceed benefits based on limited evidence.
Moderately Not Recommended	B	Recommendation against routinely providing the intervention to eligible patients. The EBPP found at least intermediate evidence that the intervention is ineffective, or that harms or costs outweigh benefits.
Strongly Not Recommended	A	Strong recommendation against providing the intervention to eligible patients. The EBPP found high quality evidence that the intervention is ineffective, or that harms or costs outweigh benefits.

Clinical Algorithm(s)

The following clinical algorithms are provided in the original guideline document:

- ACOEM Guidelines for Care of Acute and Subacute Ankle and Foot Disorders
- Initial Evaluation of Ankle and Foot Disorders
- Initial and Follow-up Management of Ankle and Foot Disorders
- Initial and Follow-up Management of Achilles Tendinopathy
- Management of Achilles Tendon Rupture
- Management of Plantar Heel Pain
- Management of Tarsal Tunnel Syndrome
- Management of Acute Ankle Sprains
- Management of Ankle and Foot Fractures

Scope

Disease/Condition(s)

Ankle and foot disorders

Guideline Category

Diagnosis

Evaluation

Management

Rehabilitation

Treatment

Clinical Specialty

Family Practice

Internal Medicine

Orthopedic Surgery

Physical Medicine and Rehabilitation

Podiatry

Preventive Medicine

Surgery

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Occupational Therapists

Physical Therapists

Physician Assistants

Physicians

Podiatrists

Utilization Management

Guideline Objective(s)

- To describe evidence-based best practices for key areas of occupational medical care and disability management
- To improve or restore the health of workers with occupationally related illnesses or injuries
- To improve the quality of occupational medical care and disability management

Target Population

Adults with potentially work-related ankle and foot disorders seen in primary care settings

Interventions and Practices Considered

Diagnosis/Evaluation

1. X-ray
2. Magnetic resonance imaging (MRI)
3. Computed tomography (CT)
4. Single-photon emission CT (SPECT)
5. Ultrasound
6. Electrodiagnostic studies
7. Bone scans

Note: Arthrography and MR arthrography were considered but not recommended.

Management/Treatment

1. Activity modification/exercise
    - Eccentric exercises
    - Stretching and loading exercises
    - Early weight bearing
    - Rest/non weight bearing
    - Balance/proprioception training
2. Medications
    - Acetaminophen
    - Non-steroidal anti-inflammatory drugs (topical or systemic)
    - Glyceryl trinitrate
    - Opioids
    - Systemic glucocorticosteroids
    - Glycosaminoglycan
    - Polidocanol
    - Botulinum toxin A
    - Local anesthesia
    - Lidocaine patches
    - Antibiotic prophylaxis
3. Physical methods
    - Cryotherapy
    - Heat therapy
    - Extracorporeal shockwave therapy
    - Iontophoresis
    - Laser therapy
    - Night splints and walking boots
    - Functional splinting
    - Casting
    - Orthotic devices
    - Heel taping
    - Intracorporeal pneumatic shock therapy
    - Ice/heat
    - Bracing
    - Pneumatic compression
4. Surgery (closed reduction, open repair, ligament reconstruction)
5. Prophylaxis for deep vein thrombosis

6. Physical/occupational therapy
7. Patient education
8. Return-to-work programs

Major Outcomes Considered

- Time to return to work
- Symptom relief

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The following databases were searched from 1966 to 2010:

- The National Library of Medicine's MEDLARS database (Medline) (www.nlm.nih.gov)
- EBM Online (www.bmjjournals.com)
- The Cochrane Central Register of Controlled Trials (http://www.thecochranelibrary.com/view/0/index.html)
- TRIP Database (www.tripdatabase.com)
- CINAHL (nursing, allied health, physical therapy, occupational therapy, social services: http://www.cinahl.com/wpages/login.htm)
- EMBASE (www.embase.com/)
- PEDro (www.pedro.fhs.usyd.edu.au/)

Ranking and Preliminary Screening of Studies

Primary sources selected for inclusion in the evidence base for American College of Occupational and Environmental Medicine (ACOEM) products and services are limited to those with the strongest apparent study design, pending quality rating. The strength and quality of study design are determined by ranking and rating of the studies according to accepted methods. Generally accepted ranking of study design for diagnostic testing and clinical treatment methods were modified by the Guideline Methodology Committee (GMC). Systematic reviews in general are not ranked as the best design in reality, as most reviews located during pilot testing of the Methodology, with the exception of many (but not all) Cochrane reviews, did not use systematic searches or quality assessments of included studies. The GMC also excluded level 4 evidence from consideration (case series, poor-quality cohort studies, poor-quality case-control studies, expert opinion without explicit critical appraisal, and expert opinion based on physiology, bench research, first principles). The focus was on the best-designed original studies, pending quality grading. For example, studies of diagnostic tests are generally limited to those compared to an acceptable gold standard, and those reporting sensitivity and specificity. Studies of clinical treatment methods are generally limited to randomized controlled trials or crossover trials. Additional literature was also reviewed when there was a paucity of higher-grade literature or if it was brought to the Evidence-based Practice Panel's (EBPP's) attention from interested parties.

To narrow the data discovered in the search to that which will be acceptable for further analysis and quality rating, researchers use additional preliminary screening criteria for original research.

Criteria for Inclusion in Study Rating and Critical Analysis of Studies of Diagnosis/Clinical Assessment Methods

1. Evaluate the efficacy (i.e., clinical accuracy) of the assessment method (i.e., the "test") in a group that contains subjects both with and without the condition the test is intended to assess.
2. Be a prospective cohort study or an arm of a randomized controlled trial (RCT).
3. Compare the findings of the assessment method (test) to an adequate reference standard for all subjects (not just subjects who tested positive).

Criteria for Inclusion in Study Rating and Critical Analysis of Studies of Treatment Efficacy

1. Evaluate a group of subjects with a representative spectrum of the clinical condition of interest.
2. Be an RCT evaluating clinical outcomes in a group receiving the intervention compared to a comparison group receiving either no intervention or a different intervention.
3. Evaluate functional outcomes that are important to a patient's overall health or well being or are important to society.

Searches are documented, listing the database searched, the search terms, article type and limits, the time frame searched (in this case, all years in the databases), the number of studies found, the number reviewed in detail, and the number included in the systematic analysis. Despite multiple database searches, many additional studies are discovered in exhaustive manual searches of article reference lists.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence Ratings

A = Strong evidence-base: Two or more high-quality studies*

B = Moderate evidence-base: At least one high-quality study or multiple lower-quality studies** relevant to the topic and the working population

C = Limited evidence-base: At least one study of intermediate-quality

I = Insufficient Evidence: Evidence is insufficient or irreconcilable

*For therapy and prevention, randomized controlled trials (RCTs) with narrow confidence intervals and minimal heterogeneity. For diagnosis and screening, cross sectional studies using independent gold standards. For prognosis, etiology or harms, prospective cohort studies with minimal heterogeneity.

**For therapy and prevention, well-conducted cohort studies. For prognosis, etiology or harms, well conducted retrospective cohort studies or untreated control arms of RCTs.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Study Assessment and Quality Rating

Studies are first abstracted into evidence tables for easier assessment. See Appendix B in the methodology companion (see the "Availability of Companion Documents" field) for a sample of an evidence table for treatment studies. Each study is formally graded for quality using a modification of the most recent assessment scheme proposed by the Cochrane Collaboration Back Group, as shown in the table below. The studies are quality rated using a 0, 0.5, 1 grade for each item, where 0 = does not fulfill the requirement; 0.5 = partially fulfills the requirement and 1 = entirely fulfills the requirement. A study with a score less than 4.0 is rated as a poor-quality study; a study with a score between 4.0 and 7.5 is rated as a moderate-quality study. A study with a score of 8.0 or greater is rated as a high-quality study.

Rating Criteria for Randomized Controlled Trials of Treatment Studies

Criterion	Description
Randomization	Assessment of the degree that randomization was both reported to have been performed and successfully achieved through analyses of comparisons of variables between the treatment and control groups
Treatment allocation concealed	Concealment of the allocation of patients to various arms of the study from all involved, including patients, clinicians, and researchers
Baseline comparability	Measures how comparable the baseline groups are (e.g., age, gender, prior treatment)
Patient blinded	The patient is not aware which group he or she is in
Provider blinded	The provider is not aware which treatment he or she is delivering
Assessor blinded	The researcher is not aware which group the results apply to
Co-interventions avoided	The degree to which the study design avoided multiple interventions at the same time
Compliance acceptable	Measures the degree of noncompliance with the treatment protocol
Dropout rate	Measures the dropout rate at different periods of time
Timing of assessments	Assessments and reassessments should be performed at the same time from inception for all study groups
Analyzed by intention to treat	Whether the study data was analyzed with an "intention to treat" analysis

Methods Used to Formulate the Recommendations

Expert Consensus

Expert Consensus (Nominal Group Technique)

Description of Methods Used to Formulate the Recommendations

Each recommendation includes citations of the specific scientific literature which supports the recommendation. The recommendations explicitly consider the health benefits, side effects, and risks of the proposed recommendation. Recommendations include the data elements described below.

Content of Recommendations for Diagnostic Testing or Treatment

1. The diagnoses for which the test or treatment is indicated
2. The specific indications for the test or treatment
3. The point in the time course of the problem for which it is appropriate
4. Prior conservative treatment that should be tried first
5. Relative and absolute contraindications to the test or procedure
6. The number of tests or procedures that are appropriate at a given time in the course of the problem
7. The potential benefits of the test or procedure
8. The potential harms, including effects on disability and return to work

The Evidence-based Practice Panels (EBPPs) for each topic area review and discuss draft practice recommendations from the research staff that includes a review of the quality evidence, evidence tables, and summaries. The strength of evidence rating is confirmed by the EBPP responsible for the topic, with review by the Guideline Methodology Committee (GMC). EBPP members may present additional comments related to their

clinical opinions and experience for panel consideration. If a unanimous decision is not possible, an EBPP may vote on the rating of the strength of the evidence to determine a consensus. Dissenters to the consensus may draft minority opinions about the strength of evidence. In practice, this has not happened as recommendations have been unanimous.

Formulation of recommendations requires clinical judgment as well as a full evaluation and consideration of the available high-quality evidence. To aid in framing recommendations, the GMC developed a list of "First Principles" based on the Hippocratic Oath ("First Do No Harm"), medical logic, appropriate sequencing and case management, shared decision-making, support of functional recovery, and relative cost-effectiveness. The First Principles are defined in Table 7 in the methodology companion (see the "Availability of Companion Documents" field). When there is insufficient high-quality evidence of effectiveness or efficacy, or the high-quality evidence is conflicting, and to guide recommendations for alternative tests or treatments when there are several options, these principles are used to guide group decision-making.

The EBPPs then assign a Strength of Recommendation to each recommendation. If a consensus cannot be reached on the recommendation or strength of recommendation, the EBPPs may use nominal group voting if agreement is not possible in the discussion. Once a consensus is reached, the EBPPs will finalize the language and strength rating of the recommendation. If needed and material, a minority opinion can be appended to the recommendation.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

Recommendation	Evidence Rating	Description of Category
Strongly Recommended	A	The intervention is strongly recommended for appropriate patients. The intervention improves important health and functional outcomes based on high quality evidence, and the Evidence-Based Practice Panel (EBPP) concludes that benefits substantially outweigh harms and costs.
Moderately Recommended	B	The intervention is recommended for appropriate patients. The intervention improves important health and functional outcomes based on intermediate quality evidence that benefits substantially outweigh harms and costs.
Recommended	C	The intervention is recommended for appropriate patients. There is limited evidence that the intervention may improve important health and functional benefits.
Insufficient - Recommended (Consensus-based)	I	The intervention is recommended for appropriate patients and has nominal costs and essentially no potential for harm. The EBPP feels that the intervention constitutes best medical practice to acquire or provide information in order to best diagnose and treat a health condition and restore function in an expeditious manner. The EBPP believes based on the body of evidence, first principles, or collective experience that patients are best served by these practices, although the evidence is insufficient for an evidence-based recommendation.
Insufficient - No Recommendation (Consensus-based)	I	The evidence is insufficient to recommend for or against routinely providing the intervention. The EBPP makes no recommendation. Evidence that the intervention is effective is lacking, of poor quality, or conflicting and the balance of benefits, harms, and costs cannot be determined.
Insufficient - Not Recommended (Consensus-based)	I	The evidence is insufficient for an evidence-based recommendation. The intervention is not recommended for appropriate patients because of high costs or high potential for harm to the patient.
Not Recommended	C	Recommendation against routinely providing the intervention. The EBPP found at least intermediate evidence that harms and costs exceed benefits based on limited evidence.
Moderately Not Recommended	B	Recommendation against routinely providing the intervention to eligible patients. The EBPP found at least intermediate evidence that the intervention is ineffective, or that harms or costs outweigh benefits.
Strongly Not Recommended	A	Strong recommendation against providing the intervention to eligible patients. The EBPP found high quality evidence that the intervention is ineffective, or that harms or costs outweigh benefits.

Recommendation	Evidence Rating	Description of Category

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

Clinical Validation-Pilot Testing

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Internal Quality Review

The Guideline Methodology Committee (GMC) assigns a committee member to each Evidence Based Practice Panel (EBPP) as a methodology consultant to assist with adherence to this methodology. The GMC reviews all recommendations for which there are questions about consistency with the defined methodology. If the GMC determines that the approved methodology has not been followed, leading to illogical or untenable recommendations, the GMC engages in direct discussions with the EBPP to reach agreement on revision. If there is no agreement or revision, then the matter will be considered by the American College of Occupational and Environmental Medicine (ACOEM) Board of Directors when the document is submitted for Board review.

External Review

ACOEM conducts external peer review of the ACOEM *Occupational Medicine Practice Guidelines* (APGs) and periodic revisions to 1) assure that all relevant high-quality scientific literature has been found, 2) assure that the important evidence from the relevant scientific literature has been accurately interpreted, 3) solicit opinions on whether the findings and recommendation statements are appropriate and consistent with the evidence, and 4) obtain general information on the conclusions and presentation of materials from external topic experts. Professional and patient organizations, as well as panel members, ACOEM Board of Directors, etc., are invited to nominate external peer reviewers.

Peer reviewers are asked to comment on the completeness of the scientific literature evaluation in their topic area, the clarity and technical accuracy of the APGs evaluation and summary of the evidence, and the appropriateness of the Guideline findings and recommendation statements.

Stakeholder Input

In a cyclical manner, ACOEM will seek stakeholder input to understand the needs and preferences of those who may utilize or be affected by the use of clinical practice guidelines in workplace settings and in the workers' compensation system. ACOEM solicits input from clinicians, health care systems, workers or patients, employers, utilization reviewers, case managers, insurers and third party administrators, attorneys, regulators, and policy makers through a variety of mechanisms. Stakeholders will be asked for comments about their experience using existing clinical practice guidelines and related products and their suggestions for future improvements. They are also asked for input on the use of clinical practice guidelines in clinical care, case management, claim administration, claim adjudication, and in the development of policies and regulations.

To ensure editorial independence in the development process, the stakeholder groups will be asked for input about the APGs, but will not be informed of panel deliberations or shown drafts of practice recommendations before the formal release of the documents. In some cases, a member of a stakeholder group may participate as a member of a Guideline EBPP or may participate in peer review or pilot testing. However, all individuals involved in the APGs development, peer review, and pilot testing are asked to keep all information about the panel's deliberations and conclusions confidential until the APGs are formally released.

Pilot Testing

The guidelines are pilot tested to determine if the recommendations are clear, easy to use, and are generally useful. Pilot testers are not asked if they think the recommendations or process for development was appropriate.

Review by the GMC and the ACOEM Board of Directors

During the entire evidence-based product development process, the GMC will work with the Panels, editors, and research staff to ensure that the evidence-based product methodology is being followed, both in the literature evaluation process and development of conclusion and recommendation statements. The Board of Directors has an opportunity to comment on the Guidelines during the external review period. Their comments are reviewed by the Panel and any necessary changes are made to the Guidelines.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Improved efficiency of the diagnostic process including identification of red flags
- Effective treatment resulting in symptom alleviation and cure

Potential Harms

- Adverse effects of medications:
  - Patients using acetaminophen should be screened for the absence of liver disease and liver disease risk factors, advised about dosing, and warned of potential hepatotoxicity.
  - Gastrointestinal effects with use of non-steroidal anti-inflammatory drugs
  - Injected glucocorticosteroids may carry the risk of tendon rupture.
  - High-volume image-guided injection (HVIGI) may carry an increased risk for tendon rupture.
  - Opioids have very high dropout rates and otherwise high rates of adverse effects.
- Surgery caries significant risk of complication, expense, and lack of comparison data to other non-surgical interventions.
- Extracorporeal shockwave therapy (ESWT) may induce frank tissue damage and pain at higher energy.
- Fatalities have been reported from the use of Botulinum toxin A, thus it should only be utilized with extreme caution. The agent induces muscle weakness and there is concern regarding long-term safety, especially with repeated dosing.
- Intracorporeal pneumatic shock therapy (IPST) has risk for hematoma, infection, or rupture.
- Radiation exposure from diagnostic procedures

Qualifying Statements

Qualifying Statements

The American College of Occupational and Environmental Medicine (ACOEM) provides this segment of guidelines for practitioners and notes that decisions to adopt particular courses of actions must be made by trained practitioners on the basis of the available resources and the particular circumstances presented by the individual patient. Accordingly, the ACOEM disclaims responsibility for any injury or damage resulting from actions taken by practitioners after considering these guidelines.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

Mobile Device Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Ankle and foot disorders. In: Hegmann KT, editor(s). Occupational medicine practice guidelines. Evaluation and management of common health problems and functional recovery in workers. 3rd ed. Elk Grove Village (IL): American College of Occupational and Environmental Medicine (ACOEM); 2011. p. 1-268. [835 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1997 (revised 2011)

Guideline Developer(s)

American College of Occupational and Environmental Medicine - Medical Specialty Society

Source(s) of Funding

American College of Occupational and Environmental Medicine

Guideline Committee

Evidence-based Practice Ankle and Foot Panel

Composition of Group That Authored the Guideline

Panel Members: Nelson S. Haas, MD, MPH, FACOEM (*Chair*); Patrick J. Beecher, MD, MPH, MBA, FACOEM; Mark Easley, MD; Hannah Edwards, MD, MPH; Harold Hoffman, MD, FRCPC; Steven Mandel, MD, FACOEM; RobRoy L. Martin, PhD, PT, CSCS; James L. Thomas, DPM, FACFAS; Pete Thomas, DPM, QME

Financial Disclosures/Conflicts of Interest

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Guidelines Related Professional Activities—None reported

Research Grants/Other Support—None

Financial/Non-Financial Conflict of Interest—None

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Guidelines Related Professional Activities—Activities related to the ACOEM Practice Guidelines Research

Research Grants/Other Support—Training grants and research grants primarily on the epidemiology of musculoskeletal disorders (e.g., CTS, shoulder tendinosis, LBP)

Financial/Non-Financial Conflict of Interest—Honoraria: Teaching honoraria from courses, ACPM and ACOEM-related; Consulting regarding how to reduce work-related injuries, causation and apportionment of injuries, work restrictions and work-relatedness injuries, and practice guidelines compliance; Clinical: Primary, secondary and tertiary clinical management of occupational injuries and diseases

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National, Regional, Local Committee Affiliations—Medical Reviewer for following journals: *Journal of Voice*, Academy of Neurology Practice Guidelines; *AADEP Disability Newsletter*; Expert Opinion Editor, *Practical Neurology*; Member, Occupational Health Subcommittee, Philadelphia County Medical Society

Guidelines Related Professional Activities—Developed evidence-based guidelines for laryngeal EMG in most peer-reviewed journals

Research Grants/Other Support—None

Financial/Non-Financial Conflict of Interest—None

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Guidelines Related Professional Activities—Clinical Practice Guideline on Heel Pain – Plantar Fasciitis for Orthopaedic Section of the American Physical Therapy Association; Clinical Practice Guideline on Achilles Tendinopathy for Orthopaedic Section of the American Physical Therapy Association; Team Leader, Orthopaedic Section, American Physical Therapy Association's International Classification of Functioning and Disability Project

Research Grants/Other Support—Co-Investigator, "Ankle Proprioception after Total Ankle Replacement," DePuy Research Grant

Financial/Non-Financial Conflict of Interest—None

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Research Grants/Other Support—None reported

Financial/Non-Financial Conflict of Interest—None reported /p>

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Guidelines Related Professional Activities—None

Research Grants/Other Support—None

Financial/Non-Financial Conflict of Interest—None

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Ankle and foot complaints. Elk Grove Village (IL): American College of Occupational and Environmental Medicine (ACOEM); 2004. 27 p. [47 references]

Guideline Availability

Electronic copies: To order a subscription to APG-I, the online version of the Guidelines, call 847-818-1800 or visit http://www.acoem.org/apg-i.aspx .

Print copies are available from American College of Occupational and Environmental Medicine (ACOEM), 25 Northwest Point Boulevard, Suite 700, Elk Grove Village, IL 60007 by calling 847-818-1800 or order online at http://www.acoem.org/PracticeGuidelines.aspx .

Subscriptions to ACOEM's Practice Guidelines App are available for iPhone/iPod and iPad interfaces from the iTunes Web site .

Availability of Companion Documents

The following is available:

- Methodology for the update of the occupational medicine practice guidelines, 2nd edition. Elk Grove Village (IL): American College of Occupational and Environmental Medicine (ACOEM); 2008. Available from the ACOEM Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on May 31, 2006. The information was verified by the guideline developer on November 3, 2006. This NGC summary was updated by ECRI Institute on July 20, 2012. The updated information was verified by the guideline developer on August 6, 2012. This summary was updated by ECRI Institute on October 28, 2013 following the U.S. Food and Drug Administration advisory on Acetaminophen. This summary was updated by ECRI Institute on September 18, 2015 following the U.S. Food and Drug Administration advisory on non-aspirin nonsteroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

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